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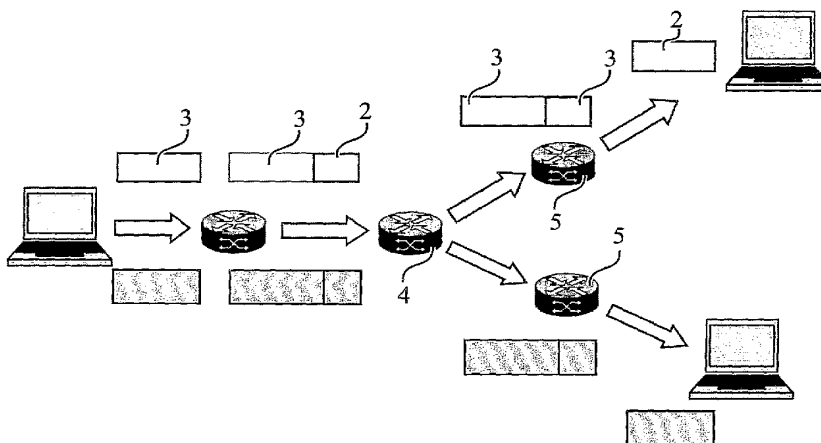
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(54) Title: OPTICAL DEVICE FOR SIMULTANEOUSLY GENERATING AND PROCESSING OPTICAL CODES

$$|T_{sk}(f)| = \prod_{v=0}^{V-1} F_v \left( a_v f + \frac{S_{sk}}{N_k \tau} \right) \quad (I)$$



(57) Abstract: The invention relates to an optical device, apt to generate and process optical codes at least one wavelength, comprising  $P$  inputs  $s$ , with  $1 \leq s \leq P$ , and  $P \geq 1$ , and  $N$  outputs  $k$ , with  $1 \leq k \leq N$  and  $N \geq 1$ , characterised in that it is apt to simultaneously generate and process  $N_c \geq 2$ , made of  $C$  chips with time interval  $\tau$ , with  $C \geq 2$ , characterised in that the transfer function  $T_{sk}(f)$  from the input  $s$  to the output  $k$  satisfies the following formula: where:  $F_v$  is a transfer function of an optical filter, for  $v=0,1,\dots,V-1$ ,  $a_v$  is a constant value, for  $v=0,1,\dots,V-1$ ,  $S_{sk}$  is an integer number ( $S_{sk} \in \mathbb{Z}$ ),  $N_k$  is a constant value, for  $k=2,\dots,N$ , and  $V$  is a positive integer number with  $1 \leq V \leq \log_2 N$ . The invention further relates to a set of optical codes, apt to be generated, in particular, by such optical device, and to networks and apparatus comprising such optical device.

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